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The Positive and Negative Impacts of the COVID-19 Pandemic Towards Youths' Mental Health

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Abstract

Due to quarantine measures, the impact of COVID-19 on youths' mental health may be more significant than on their physical health. This study aims to map out the positive and negative implications that COVID-19 brings concerning mental health. The main dependent variable of our study will be the evaluated mental health of Singaporean youths. Based on previous research and articles, we have chosen the difference in education level as our key independent variable and social isolation, lack of physical activity, family conflicts, and family emotional support as the control variables. Our study will be conducted through a survey on Singapore's primary and secondary school students by multi-stage cluster sampling and stratified sampling. The cross-sectional data collected will be sorted and analyzed through t-test, chi-square test, and regression analysis. The findings of this study can help schools and governments in their development and implementation of policies to improve our youths' mental health which has become an important issue in recent times. The survey data will aid us in better understanding the pandemic's effects on Singaporean youths' mental health, especially since the pandemic has been continuing longer than most expected.

Keywords: COVID-19, Education levels, Mental health, Singaporean youths

Introduction

The COVID-19 pandemic caused many changes in the lifestyles of youths around the world. They experienced reduced physical interaction and in-person education; typically, common experiences youths expect in their developmental years. These youths were mainly required to stay at home and face extended exposure to their families. These are caused by the lockdowns and restrictions imposed by governments from various countries. Some examples are the shutting down of schools, closure of recreational facilities, and halting of social activities (Cost et al., 2021). These restrictions are just some of the many factors that affect the youths' mental health as they live in isolation and away from their usual social environment. However, these effects are not all necessarily negative. Some positives are being identified as well. As Singapore's restrictions are known to be among the harshest, our research aims to investigate and identify the various pros and cons of how the COVID-19 pandemic restrictions have impacted youths' mental health in Singapore.

The study could give an insight into how youths are coping with their mental health during the pandemic and bring awareness that there are not only negative impacts brought about by the pandemic. Parents and teachers could use this study as a heads-up to mitigate the negatives and capitalize on the positives when dealing with and bringing up their children.

Literature Review

Previous studies have focused on the pandemic's negative impacts on youths' mental health. It is widely assumed that this unexpected period has robbed many youths of the conventional social and educational life pre-pandemic, thus negatively impacting their mental well-being. However, there is a need to delve deeper into the positive aspects of the pandemic and its consequences. This compilation hopes to shed light on different perspectives of the impacts, serve as a guide to managing the well-being of these youths, and fulfill the study's objective. The following impacts would bring about long-term effects on youths' mental health.

Negative Impacts

Regarding the negative impacts of the COVID-19 pandemic on youths' mental health, most studies in Singapore have shown depression, anxiety, and stress levels (Goh, 2021). Hence, we want to explore and analyze three other cons which have not been widely covered in the local context. They are social isolation, lack of physical activities, and increased risk of domestic abuse.

Social Isolation

The tightened restrictions have caused youths to remain indoors most of the time, where they cannot physically interact and bond with their peers (Cowie & Myers, 2020). Social isolation could hinder their social development and interaction skills, resulting in their inability to communicate well and lack of social awareness (Bates, 2021). These factors are common reasons youths are exposed to being bullied and becoming bullies themselves. They might not have the social understanding to differentiate between good and bad forms of communication. Based on a study conducted in Europe in 2011 conducted between children of age groups 9-16 years old on internet utilization highlighted that one in twenty children interviewed faced a situation of cyberbullying on at least one occasion every week

(Livingstone et al., 2011). One out of ten children faced this situation at least once every year, while 12% of youths indicated they had committed acts of cyberbullying within the year (Livingstone et al., 2011). The study was conducted through a survey to investigate key risks that youths can experience on the internet, where one key risk was cyberbullying (Livingstone et al., 2011). Hence, social isolation can lead to poor development of social skills, harming innocent youths due to bullying, which results in adverse mental health impacts such as low morale and self-esteem. The limitation of the study of cyberbullying is that it is conducted in Europe, where the social cultures might differ from other parts of the world, especially from Asia, where Singapore is located. Our study on this factor could strengthen the accuracy of results by focusing more attention on the youths in Singapore and seeking their opinions on the matter through surveys.

Lack of Physical Activities

Due to the restrictions imposed in the pandemic, the freedom of physical activities has been cut down not just in the public setting but in schools' curriculum of physical education as well (Sirisena et al., 2020). Physical education is an integral part of a youth's growth, and it is especially vital to make sure they keep up with a healthy lifestyle, both physically and mentally. With the reduction of such activities, youths might start to neglect the importance of physical activities as they are not exposed to them in their developmental years. It could have a long-term effect on their mental health as physical activities help reduce stress, which is currently the common emotional effect of the pandemic. When humans exercise and engage in various physical activities such as sports, our body produces endorphins, also known as natural painkillers, that help relieve stress and anxiety (ADAA, n.d.). Having a good habit of keeping physical activity a part of the youth's lifestyle can aid the improvement and stability of their long-term mental health, giving them a stress-relieving option. Engaging in physical education allows students to build resilience, empathy, confidence, and social

skills such as camaraderie, which are all factors that contribute to good mental health. Without the exposure of such activities due to the restrictions, especially in their vulnerable stage of cognitive and social development in life, it can affect their mental growth in the long run (Active Health, n.d.). However, when using the amount of physical activity engaged as a factor in our study, we must note other external attributes that may affect the responses in surveys. One such external attribute could be the respondent's current or pre-existing health conditions, which could be a barrier to the fairness or accuracy of the factor in question.

Increased Risk of Domestic Abuse

A direct consequence was mass unemployment and financial insecurity for many parents. Their mental health was negatively affected, coupled with increased levels of stress and uncertainty, which only served to strain their relationships with their children (Prime et al., 2020). While domestic abuse is widely understood as physical abuse, it can also be brought about directly or indirectly in the form of psychological abuse. For example, the research by Prime et al. (2020) explained that experiencing domestic abuse or witnessing it on another family member can impact a child, threatening their mental well-being in the long term. In Singapore, there was a reported 22% increase in offenses related to domestic abuse from 7 April 2020 to 6 May 2020, which was the start of its Circuit Breaker period, compared to prior months (Singapore Police Force, 2020). As the research by Prime et al. (2020) does not include context from Singapore's pandemic setback, further research will have to be done to fill the gap. The study can be done through anonymous surveys or liaising with psychological institutions in Singapore.

Positive Impacts

Previous studies have focused on negative impacts resulting from this pandemic, which has had adverse impacts on youths' mental health. However, one point to note is that the positive impacts of the pandemic are not widely focused on in the said previous studies,

which may result in a lack of awareness in this area. Hence, our study explores two positive

factors: emotional support from family and the absence of academic peer pressure.

Emotional Support from Family

In Singapore's context, the government-imposed Work from Home (WFH) on parents

and Home-Based Learning (HBL) for children aid in better parent-children bonding (Adelphi

Psych Medicine Clinic, 2021). While parents feel the pressure to adapt to the new normal and

keep the family together, it is essential to remember that youths also feel pressure to adjust to

the new lifestyle. Youths are at risk of being affected by disturbances caused by the current

pandemic, which has hindered their maturity, both mentally and socially, causing long-term

effects (Adelphi Psych Medicine Clinic, 2021). The World Health Organization (WHO) has

suggested that parents ask their children how they cope mentally in the current pandemic at a

level appropriate to their age (Tang et al., 2021). A separate study based on a large school-

based survey conducted in Chongqing, China, identified that communication duration and

frequency are key risk factors for depressive symptoms (Guang et al., 2017; Tang et al.,

2021). It stated children who engaged in discussion with their parents had reduced symptoms

of depression, anxiety, and stress as much as those who did not. The limitation, however, is

that this research does not consider the job types and levels of the parents when assessing

emotional support received. Parents with more demanding jobs would have less emotional

support for their families despite the WFH arrangement. Hence, our research can incorporate

a survey that includes job types of parents.

Absence of Academic Peer Pressure

A study conducted in China reported that youths who attend a higher level of

education tend to face much higher levels of anxiety, depression, and stress to perform well

in their academics. Compared to youths in lower education levels, many felt happy with

school closures because the home environment was less competitive. They enjoyed an

elevated level of peace (Tang et al., 2021). Another significant finding reported was that those in the upper education levels were not as happy with their quality of life having to attend school and enjoyed the feeling of home quarantine (Tang et al., 2021). The limitation of this study is that the education system in China differs from the one in Singapore. At various levels of the education system, the youth might feel another degree of stress depending on their level of study. Hence, we can improve this study by comparing the stress level between primary and secondary school youths in Singapore to provide more accurate findings.

Although past studies have found both positive and negative impacts on students, most studies have been done right after the pandemic. Our team hopes to provide further insights through our research, given that it has been over 2 years since the pandemic imposed many restrictions on our lives. Additionally, our team hopes to build on the existing research's data and limitations to distill and refine the different variables and methodology used. We would then integrate them into our research study to provide a more specific focus on Singaporean youths' mental health under local conditions and environment.

Research Question

The study's main objective is to investigate the impacts that several factors experienced under the COVID-19 pandemic restrictions by typical Singaporean youth have had on their mental health. What are the key positive and negative effects of the local regulations on Singaporean youths' mental health?

In addition, our study will find out how the different emotional and social issues can affect mental health. The team will narrow down the factors to social isolation, lack of physical activities, increased risk of domestic abuse, emotional support from family, and absence of academic and peer pressure.

Theoretical Framework

Based on the literature review we have conducted, there are a few different attributes that can positively and negatively affect a Singaporean youth's mental health under the COVID-19 restrictions. The factors included emotional support from family members and the absence of academic peer pressure as two advantages. At the same time, social isolation, a lack of physical activity, and an increased chance of domestic abuse are the disadvantages identified.

Key Independent Variable

A study by Nearchou et al. (2020) found that youths from different age groups report different levels of symptoms of mental distress. Based on a questionnaire by Zhou et al. (2020) that was made concerning measurements of psychological health problems in Chinese adolescents during the outbreak of COVID-19. Findings suggested that students in higher education reported higher levels of mental distress, while students in lower education reported milder levels of mental distress. Hence, our team has decided to select the different educational levels in the country as our key independent variable. Additionally, we want to find out if this result is mirrored in the Singapore setting, which has one of the strictest and most ridge education systems in the world (Tan & Ng, 2020).

Controlled Independent Variables

Factors that can contribute to mental health such as social isolation, lack of physical activities, increased risk of domestic abuse, emotional support from family, household income, and the absence of academic and peer pressure are all independent variables that can control the dependent variable. We will craft out a set of sample questions and measurables pertaining to the experiment's controlled independent variables listed above. Every participant will have the same question set. Another independent control variable to note is ensuring the respondents have no pre-existing health conditions. Having a pre-existing health

condition could hinder the accuracy of the experiment as they already have external stressors and may differ from the majorities thinking and perception. On another note, the factor of increased risk of domestic abuse might be sensitive to some respondents, hence our team will rename the factor to a similar term of family conflicts.

Dependent Variable

We will be analyzing a group of youths in Singapore on their mental health as our dependent variable. To evaluate an individual's mental health, we will craft our survey by inferring sample questions from the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a behavioral screening questionnaire that fits the age demographic in question, comprising 3 to 16 years old. The higher the sum of the average score from the survey by each respondent will denote a lower level of mental health. Our team will also be using the COVID-19 Pandemic Mental Health Questionnaire (CoPaQ) to help strengthen the structure of our survey questions.

Methodology

Our goal is to gather a sufficient sample size of more than 384 primary school students and 384 secondary school students in Singapore, who will fill up a questionnaire based on the different control independent variables that affect youths' mental health. First, a multi-stage cluster sampling and stratified sampling will be used to select the school and students to survey respectively. In this experiment, we would use probability sampling techniques as they are preferred over non-probability sampling techniques to reduce bias tendencies. Non-probability sampling is convenient and cost-efficient but could encourage skewed results. Hence, stratified random sampling would be our sampling technique to allow for variances while still adhering to the control independent variable. Our team will be liaising with the school principal to gain approval to conduct the research and survey. The questionnaire will then be sent to the respective school counselor and uploaded into the

Learning portal of the chosen student. The survey will be done in a controlled environment, under the supervisor of the school counselor, and ensure that the results are uncompromised. In-depth methods on the survey will be covered in the data collection methods of the paper

Hypotheses

The study's null hypothesis (H0) is that COVID-19 does not affect the mental health of Singaporean youths differently depending on their education level. The study's alternate hypothesis (H1) is that there is a difference in the impact of the education level of Singaporean youths on their mental health during the COVID-19 pandemic. COVID-19 affects the mental health of Singaporean youths differently depending on their education level.

Study Design

This study aims to develop insight into how youths are coping mentally during the COVID-19 pandemic and to understand how they are affected mentally while considering the positive aspects of the outcome of the pandemic. The research question would be: How does the COVID-19 pandemic affect the mental health of Singaporean youths differently depending on their education level. The study's null hypothesis (H0) is that COVID-19 does not affect the mental health of Singaporean youths differently depending on their education level. The study's alternate hypothesis (H1) is that there is a difference in the impact of the education level of Singaporean youths on their mental health during the COVID-19 pandemic. COVID-19 affects the mental health of Singaporean youths differently depending on their education level.

Our team intends to survey Singaporean youths, based on their current education level, regarding their mental wellbeing pre-pandemic, current mental wellbeing, as well as noting other indicators that may influence mental health. The study will use cross-sectional data gathered from at least 384 primary and secondary school students. We will collaborate with counselors and principals of selected schools to gain approval to distribute our survey to students through their Learning Management System (LMS). Data collected will be extracted to Microsoft Excel and R and analyzed through descriptive statistics, chi-square test, ANOVA test, and regression analysis.

Population and Sample

The population group for our study will include primary and secondary school students in Singapore. We will be using a combination of multi-stage cluster sampling, where we choose schools, and stratified sampling, where we sample 10% of students from each education level. To expand on this point, we will cluster the schools into the respective regions of Singapore, namely North, South, East, West, and Central. The team will be focusing on schools located in the East cluster as our school is located nearer to that region. Data collected showed an estimated 232,650 primary school students and 162,071 secondary school students enrolled in 2020 (Ministry of Education, 2021b). Additional data also indicates that there are 180 active primary schools and 136 active secondary schools (Ministry of Education, 2021a).

To determine the average number of students studying in each school based on their level of study, we will divide the number of students studying in their various educational levels by the number of active schools. The results indicate an estimated amount of 1,293 students per primary school and 1,192 students per secondary school. Figure 1 explains the sample sizes necessary for any given population from 10 to 1 million, states that at least 384 samples are needed to represent a general population size of above 75,000 people (Guthrie, 2013). To achieve 384 samples, we will assign numbers to the clustered primary and secondary schools and randomly choose four of each, surveying 10% of students from each school.

Obtaining 10% of students from each school will help reach our goal of a minimum of 384 samples and reduce biases in the different school population representation of data. In some schools, the number of students might vary from each other, hence, sampling a percentage instead of an exact number of students would produce a better representation of the school. 10% of students from a selected primary school, according to the estimated

student population in that primary school, stands at 129 students. 10% of students from an established secondary school, according to the estimated student population in that secondary school, stands at 119 students. The sum of these students from 4 different schools each would be more than 384 samples, which makes our observations more accurate and serves as a good presentation of the population.

Limitation

As always, in every study, there will be several limitations. The first limitation is that we will not gather and survey all primary and secondary school students in Singapore. There are an estimated 232,650 primary school students and 162,071 secondary school students as of 2020 (Ministry of Education, Singapore, 2021). We can only collect data from a small percentage of students out of the entire population. The other limitation is that some primary school students might not understand the context of our survey with regards to terminology and words used. The survey questions might be too complex for students at that age to interpret and relate. It might result in an inaccurate truthful response given, potentially affecting the accuracy of our survey results and findings.

Mitigation

Having identified the limitations, the team will modify our sampling and survey methods to mitigate the constraints and produce a reliable and fair result. Firstly, the team will be clustering the population based on the respective regions in the country that are North, South, East, West, and Central. The team will be focusing on schools located in the East due to geographical convenience. To make up the total sample of 384 students can be selected by 10% of each of the schools we surveyed, as mentioned in the population and sample section. We can better represent the entire population by having an appropriate sample size according to Figure 1. Secondly, the survey that we will be using must be crafted so that primary school students can understand higher complexity questions and answer them accurately to the best

of their abilities. A method to aid in their understanding would be to design the questions with less complex and challenging words that might hinder comprehension. However, some terms or terminologies cannot be substituted. Hence, we could run the survey through the primary school English teachers and the school counselors to help explain and simplify the context of some of those questions or phrases to help them answer as precisely as possible.

Variables and Measures

Key Independent Variable

Our key independent variables are the education level of Singaporean youths, namely primary school and secondary school. The rationale of why we chose education level as a key independent variable is because our team expects a disparity in stress factors between education levels. It can be attributed to the more taxing syllabus and examinations faced in higher levels of education. Hence, we are proposing to divide the youths into primary school and secondary school students to check if the pandemic affected them differently.

Control Independent Variables

Other indicators can contribute to the variation of mental health in youths during the COVID-19 pandemic. Firstly, age is a control variable due to the different age ranges at different education levels, where maturity might affect how an individual handles their mental health. Household income is an independent control variable as the pandemic has affected many families and their livelihoods concerning monetary stresses and job security. This would lead to changes in lifestyle for families that might impact the overall mental health of their youths. However, getting an accurate response from primary school students might be a challenge as they might not know their actual household income. Hence, this is a limitation the team must consider. Secondly, lack of social interaction and physical activities can reduce youths' social and interpersonal skills and hinder a healthy lifestyle while going through their most critical stage of development, potentially impacting their mental health in the long run. The attitude of family members is a factor that could affect the youth's mental health positively or negatively. In times of stress, an increase in the risk of domestic abuse, or family conflicts in general, could gravely impact the youth's mental health. However, emotional support from family during the extended staying home regime can improve youths' mental health. Home-based Learning (HBL) is beneficial to some youths as it removes social

pressure, such as academic and peer pressure, that might be daily stressors to their mental health (Tang et al., 2020). Another independent control variable to note is the respondent's pre-existing health conditions. Having a pre-existing health condition could influence the accuracy of the experiment as they already have external stressors and may differ from the majority's thinking and perception.

Dependent Variables

With a focus on analyzing the impact of education levels and the other indicators on Singaporean youth's mental health, our dependent variable of this research will be the level of mental health of youths in primary school and secondary school level. The level of mental health will be measured by the results of our survey that will be elaborated on further in the data collection section of the paper.

Measurement of Variables

The key independent variable will be measured by different educational levels of either primary or secondary school level. The independent control variables will be measured with a few different scales, such as age by year, a range for household income, and the 5-point Likert scale for each section of indicators of mental health questions in our survey. The data collection section of our paper will cover more about the 5-point Likert scale. The dependent variables will be measured by tallying the responses on the 5-point Likert scale. The sums and averages of responses on mental health indicators will be calculated and compared as not every question has the same number of options, giving room for extremities. The results to determine the data collected would analyze the impact of the pandemic on youths' mental health, with higher mean scores representing a lower level of mental health.

Data Collection Methods

The team will use a survey to investigate the factors that influence the mental health of Singaporean youth. We will use the key and control independent variables to formulate the survey questions. To help strengthen the survey, we will infer from questions used in previous studies, such as the COVID-19 Pandemic Mental Health Questionnaire (CoPaQ) (Rek et al., 2020). The proposed survey is in Appendix A of the paper. The team also understands that asking the respondents about how they feel about mental health directly might be uncomfortable and sensitive to some, and the younger respondents might not be able to accurately judge and answer the question. Thus, we will be reference sample questions from the Strengths and difficulty Questionnaire (SDQ). The questions are designed by using emotional symptoms, peer relationships, and behavioral problems as attributes to measure mental health.

We intend to gather data by surveying both primary and secondary school students in Singapore from the selected schools, using the multi-stage sampling method mentioned in the population and sample section of the paper. The team would also include a section at the end of the survey asking participants if there were any other factors that positively or negatively impacted their mental health during the pandemic but were not mentioned in the study. It is to improve our assessment of the variables used. We would craft emails sent to school principals to request permission to conduct our survey and research, emphasizing the study's purpose and importance and how the results would benefit the school.

After the survey is completed, the team will investigate what factors affect the students' mental health. The schools will receive the findings, which serve to help them understand how their students are dealing with mental health issues and be able to devise initiatives to help them improve or manage their mental health during this period of uncertainty. Allowing the school faculty to understand the student better will provide more

mental and social care to the students through counseling, parent-teacher meetings, or even activities that aid in mental health improvement.

According to a Channel News Asia news article by Lin (2021), the Singapore Minister of Education mentioned that at present, every school in Singapore had deployed at least one school counselor to meet the needs of their students. In this case, we will collaborate with the school counselors to administrate the survey. The survey will be uploaded onto the respective Learning Management System (LMS), a student learning portal, providing easier access for the counselor and the student. The counselor will oversee the survey and assist the student with any queries about the survey questions.

The type of data collected will be a cross-sectional data set. Our dataset does not focus on the time factor but rather the different variables and experiences the students face currently (Statista, n.d.).

The team will later develop a questionnaire on a platform called Qualtrics. As most of our variables are challenging to define, we intend to use a 5-point Likert scale to assist the students in answering the questions truthfully and to the best of their abilities. While the 5-point Likert scale is not as reliable as a 7-point or 10-point Likert scale, fewer parameters will assist us in obtaining cleaner data, and the increased comprehension permits respondents to better answer the questions with ease (Formplus, 2021).

Before this study, there had not been any reported survey or findings on the mental health of youths in primary and secondary school students during the pandemic; hence, we cannot utilize any secondary data. After the survey duration of around 1 to 2 months is done, we will collect the data and insert it into Microsoft Excel and R for data interpretation and analysis.

Data Analysis Methods

After considering the proposed data collection methods and collating the appropriate responses, we will clean the incorrectly formatted and incomplete data within the dataset before performing data analysis using the required software. The team will also convert qualitative variables into quantifiable dummy variables to run analysis more efficiently. The resulting data analysis would serve to help the team test our hypothesis.

Descriptive Statistics

The function of descriptive statistics is to help summarize a dataset by pointing out its key properties. These key properties include the mean, standard deviation, the minimum and maximum, and the total count of respondents from the dataset. Presenting the raw data found would make visualizing the dataset difficult. Therefore, descriptive statistics is a valuable tool that aids in delivering data in a more meaningful way, which allows for a more straightforward interpretation of the data and a basis for further test and analysis.

Chi-Square Test

The purpose of conducting the chi-square test is to allow the team to compare the anticipated types of responses against the actual responses made to decide any variances between the observed variables and the expected variables (JMP Statistical Recovery, n.d.). Referring to previous research, we expect that students in the upper levels of study will experience higher levels of mental distress than those in lower grades (Zhou et al., 2020). Figure 2, which shows the findings of depressive and anxiety symptoms throughout the different education levels in China, indicates that the lowest education level of junior grade one reported at 32.0% for depressive symptoms and 28.3% for anxiety symptoms. As we progress through the education levels, we can observe a rise in the percentage of depression and anxiety symptoms, where the senior grade three's percentages stand at 59.9% and 53.2%, respectively. As such, we can predict that secondary school students will indicate in the

survey that they are experiencing a higher level of mental distress than primary school students. The chi-square test in our study can verify the differences in the frequency expected from the previous research and the frequency observed in our research and survey.

T-Test

We can use the two-tailed t-test to observe if various independent variables influence youths' mental health in primary and secondary school. We compare two groups (primary and secondary school) with more than one observation. We will use a two-tailed t-test for two samples assuming unequal variances. We can see if the effect is statistically significant by calculating the p-value of the variables (p-value<0.05). For example, we will use a t-test to see if household income influences youths' mental health at the education level (primary and secondary school). If the interaction between education level is statistically insignificant but is statistically significant between household income, thus we can observe that household income affects youths' mental health.

Regression Analysis

This study will utilize regression analysis to determine the relationship between independent and dependent variables. Analyzing the data plot can help identify the level of influence the independent variable has on the dependent variable and how its coefficient affects the dependent variable. This equation estimates the regression:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 Z_2 + \varepsilon$$

y denotes the dependent variable of mental health. β_0 denotes the intercept, and ε denotes the residual. x_1 denotes the key independent variable, which is the level of education of Singaporean youths. A dummy variable will take 1 if the respondent is in secondary school or 0 if the respondent is in primary school. Z_2 is the vector of control independent variables, which is comprised of indicators such as age, social interaction, physical activity, household

income, family conflicts, social pressures, and pre-existing health conditions that can influence mental health.

Conclusion

In conclusion, our study aims to research the impact that the COVID-19 pandemic has on the mental health of Singaporean youths and if there are any differences based on their education levels. Our paper will highlight the different contributing factors that impact youths' mental health after these two years of living with the virus. Our team's first limitation was the inability to survey all primary and secondary school students in Singapore. To mitigate this issue, we decided to collect a reliable percentage of the population from sampling by referring to Figure 1. Additionally, as we are surveying primary school students, some questions might be hard for them to interpret and give a proper and accurate answer, which might affect the significance of our result. To combat this, we decided to work with school counselors and teachers to revise the survey if needed to a level of understanding a primary school student can interpret. The results from this study would help governments and schools develop policies and solutions to address better and manage the mental health of these youths going through a tough time in their developmental years.

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Tables and Figures

Figure 1

*Table of Population to sample size table (**Guthrie, 2013**)*

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2,800	338
15	14	110	86	290	165	850	265	3,000	341
20	19	120	92	300	169	900	269	3,500	346
25	24	130	97	320	175	950	274	4,000	351
30	28	140	103	340	181	1,000	278	4,500	354
35	32	150	108	360	186	1,100	285	5,000	357
40	36	160	113	380	191	1,200	291	6,000	361
45	40	170	118	400	196	1,300	297	7,000	364
50	44	180	123	420	201	1,400	302	8,000	367
55	48	190	127	440	205	1,500	306	9,000	368
60	52	200	132	460	210	1,600	310	10,000	370
65	56	210	136	480	214	1,700	313	15,000	375
70	59	220	140	500	217	1,800	317	20,000	377
75	63	230	144	550	226	1,900	320	30,000	379
80	66	240	148	600	234	2,000	322	40,000	380
85	70	250	152	650	242	2,200	327	50,000	381
90	73	260	155	700	248	2,400	331	75,000	382
95	76	270	159	750	254	2,600	335	1,000,000	384

Source: Krejcie and Morgan (1970).
Note: N = population size; S = sample size.

Figure 2

Table of Depressive and anxiety symptoms of Junior and senior high school students in China

(Zhou et al., 2020)

Variables	n	%	Depressive symptoms			Anxiety symptoms		
			n	%	P	n	%	P
Gender					0.001			0.038
Male	3753	46.5	1566	41.7		1358	36.2	
Female	4326	53.5	1967	45.5		1662	38.4	
Region					< 0.001			< 0.001
City	3103	38.4	1169	37.7		1009	32.5	
Rural area	4976	61.6	2364	47.5		2011	40.4	
Grade					< 0.001			< 0.001
Junior grade one	625	7.8	200	32.0		177	28.3	
Junior grade two	2248	27.9	820	36.5		756	33.6	
Junior grade three	882	10.9	404	45.8		347	39.3	
Senior grade one	2220	27.6	1,000	45.0		801	36.1	
Senior grade two	1486	18.4	739	49.7		610	41.0	
Senior grade three	596	7.4	357	59.9		317	53.2	

Appendix A

Survey Questionnaire

Introductory message and instructions

Good day students! We are a group of undergraduate students from Embry-Riddle

Aeronautical University-Asia attempting to complete a research paper for our module on the

Introduction to Research Methods.

We would like to thank you for helping us to complete our survey on how the COVID-19

pandemic has impacted your mental health.

The survey will take approximately 10-15 minutes to complete. All responses will be kept

anonymous and personal information will be kept strictly confidential. The information

collected from this survey is strictly for research purposes only.

Section 1: Personal information

1. Gender

    a. Male

    b. Female

2. Age (As of 2022)

    a. [Input ranges from 7 to 17 years old]

3. Education Level

    a. Primary School

       Secondary School

4. Household income (Annual)

    a. Less than $20,000

    b. $20,000 to $34,999

    c. $35,000 to $49,999

    d. $50,000 to $74,999

    e. $75,000 to $99,999

    f. Over $100,000

5. Have you been diagnosed with a mental disorder before the pandemic?

    a. Yes

    b. No

Section 2: COVID-19 pandemic impact on social interaction

1. COVID-19 pandemic has a negative impact on the level of social interaction I am getting.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

2. I have less social interaction with my peers during the COVID-19 pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

3. I am unable to communicate with my peers well about my concerns in school or life during the pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

4. The emotional support from my peers has decreased during the COVID-19 pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

5. Due to the extended period of staying online during the pandemic, I am exposed to more cyberbullying than in the pre-pandemic period.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

6. I am more restless without social interaction with my peers.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

Section 3: COVID-19 pandemic impact on physical activity

1. The COVID-19 pandemic has a negative impact on the level of physical activity I am getting.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

2. I am less physically active during the COVID-19 pandemic as compared to the pre-pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

3. I feel the loss of a stress-relieving option when physical education is reduced due to the restriction set in the pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

Section 4: Attitude of family members during COVID-19 Pandemic

1. How would you rate the emotional support your family members give you during the pandemic?

    a. No Support

    b. Little Support

    c. Moderate Support

    d. Good Support

    e. Excellent Support

2. Have you experienced more family conflicts during the COVID-19 pandemic as compared to pre-pandemic?

    a. Slight Decrease

    b. Great Decrease

    c. No Conflict

    d. Slight Increase

    e. Great Increase

3. I can communicate and share my worries with my family more during the home base learning period.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

Section 5: COVID-19 Pandemic impact on social pressures (Academic and peer)

1. The COVID-19 Pandemic has decreased the academic pressure experienced. (Academic expectations from teachers, coaches, or peers)

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

2. Academic pressure has affected my anxiety levels during this pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

3. The COVID-19 Pandemic has decreased the peer pressure experienced.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

4. Peer pressure has affected my anxiety levels during this pandemic.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly Disagree

Section 6: How did you feel in terms of emotions? (Pre-pandemic)

1. How often do you experience the following in the pre-pandemic era? Please tick 1
    each.

	Never	Once in a while	About half the time	Most of the time	Always
Considerate of other people's feelings					
Willing to share things with other people					
Willing to listen to instructions					
Feelings of worry					
Willing to help others in need					
Easily loses temper					
Tendency to fight with other people					
Unhappy, depressed, or tearful					
Easily distracted					
Easily lose confidence					

Bullied by other children					
Fearful of the future					

Section 7: How do you feel in terms of emotions? (Currently)

	Never	Once in a while	About half the time	Most of the time	Always
Considerate of other people's feelings					
Willing to share things with other people					
Willing to listen to instructions					
Feelings of worry					
Willing to help others in need					
Easily loses temper					
Tendency to fight with other people					
Unhappy, depressed, or tearful					
Easily distracted					

Easily lose confidence					
Bullied by other children					
Fearful of the future					

Section 8: Additional pointers to suggest

1. Are there any other factors and indicators that positively or negatively impact your mental health during the pandemic but were not mentioned in the study
   a. [Input open-ended response]

Thank you for taking the time to complete this survey. Our team truly values the information you have provided. Your responses will contribute significantly to our research analysis.